

US Pat. App. No: 09/597,763
Conf. No: 5987
June 26, 2003

REMARKS

Claims 1-7 are pending in this application. Claims 1-7 have been rejected.

Claims 8-15 have been cancelled without prejudice. Claim 1 has been amended to require that the ceramic sheet has a thickness of 50 μm or more. Claim 6 has been amended to require that the sheet has a thickness of 50 to 500 μm . Support for these amendments appears in the specification at page 31, lines 17-20, in the Examples, and in the claims as originally filed. No new matter has been added.

Further and favorable reexamination and reconsideration is respectfully requested in view of the foregoing Amendment, and the following remarks.

I. At page 2 of the Official Action, the Examiner requires cancellation of the non-elected claims or other appropriate action.

The non-elected claims, claims 8-15, have been cancelled without prejudice.

II. At page 2 of the Official Action, claims 1-7 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Takeuchi et al. (US 5,733,499).

The Examiner states that it would have been obvious to one of ordinary skill in the art that a surface roughness of less than .2 μm would limit burr and dimple heights to less than 100 μm because of the teachings of Takeuchi that low surface defects are desired. In support of his position the Examiner points to column 1, lines 25-30, of Takeuchi. In view of the following, it is believed that this rejection is overcome.

Takeuchi is directed to a method for producing a ceramic substrate where the substrate includes ceramic particles having a spherical diameter of 0.01-0.5 μm of a primary particle as the ceramic component, an average degree of aggregation of 10 or less, where the ceramic sheet contains at most one volume percent of secondary particles having a diameter of 20 μm or more and have a

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surface roughness of 0.2 μm or less. Takeuchi requires that the ceramic substrate has a thickness of 30 μm or less.

Claim 1 has been amended to require that the claimed ceramic sheet has a thickness of 50 μm or more. Claim 6 has been amended to require that the sheet has a thickness of 50 to 500 μm . Support for these amendment appears in the specification at page 31, lines 17-20, and in the Examples.

Takeuchi does not teach or suggest a ceramic sheet or substrate having a thickness within the claimed range of 50 μm or more, as required by present claims 1-5 and 7. Rather, Takeuchi requires a ceramic substrate having a thickness of 30 μm or less. Please see claim 1 of Takeuchi. Takeuchi discloses at column 2, lines 12-15 that their invention provides a method for producing a ceramic substrate having a thickness of 30 μm or less. Further, example 1 of Takeuchi at column 8 discloses the production of a ceramic substrate having a thickness of 7 μm . Examples 2 at column 10 discloses the production of the substrate having a thickness of about 10 μm .

Takeuchi does not provide any suggestion, motivation, or incentive, to modify his ceramic substrate to produce a ceramic sheet having a thickness within the presently claimed range of 50 μm or more. In fact, Takeuchi discloses at column 1, lines 22-30, that there has been a recent demand in the art for a particularly thin ceramic substrate or green sheet having a thickness of at most 30 μm , but that it is difficult to make such product without surface defects. Takeuchi states that many of such products have to be disposed of as defective goods. At column 3, lines 32-39, that their invention provides a green sheet containing ceramic particles with a spherical diameters 0.01-0.5 μm as the primary particle, and by specifying the spherical diameter, a ceramic substrate having a thin thickness can be produced. Takeuchi describes this "thin thickness" as being 30 μm or less.

Further, Takeuchi employs a reverse roll or coat method for molding a ceramic slurry into a ceramic green sheet whereas the present invention employs a doctor blade method for obtaining a ceramic green sheet (see claim 1 of Takeuchi). Takeuchi states that the thin ceramic sheet cannot the produced using the doctor blade method. See column 5, lines 65-67 of Takeuchi. That is, the rolling

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method and the raw material of Takeuchi as suitable for making a ceramic sheet having a thickness of 30 μm , at most.

Takeuchi does teach or suggest a ceramic sheet or substrate having a thickness within the currently claimed range. Further, Takeuchi does not teach or suggest a method for providing a ceramic sheet having a thickness within the claimed range. In fact, Takeuchi discloses that their ceramic sheet cannot be produced using the doctor blade method. Takeuchi does not teach or suggest a ceramic sheet having the claimed burr height and dimple height. Further, Takeuchi does not teach or suggest the properties of the claimed ceramic sheet including, for example, electrical strength as defined in the specification at, for example, page 31, lines 17-20.

Obviousness under 35 U.S.C. § 103 requires some suggestion, incentive, or motivation, in the prior art itself, to make the claimed combination, along with a reasonable expectation of success. In the present case, there is no teaching, suggestion, or motivation, to modify the ceramic sheet of Takeuchi to produce the claimed ceramic sheet having the claimed thickness. Further, Takeuchi provides no reasonable expectation of success because Takeuchi teaches that suitable ceramic sheets cannot be produced using the doctor blade method of the present invention.

In fact, Takeuchi teaches away from the presently claimed invention where the ceramic sheet has a thickness of 50 μm or more. Takeuchi teaches that only ceramic sheets having a thickness of 30 μm or less, are presently desirable. Further, Takeuchi requires that their ceramic sheets have a thickness of 30 μm or less. Takeuchi exemplifies the production of ceramic sheets having a thickness of 10 μm or less.

It is submitted that nothing in Takeuchi, renders the claimed invention obvious, within the meaning of 35 U.S.C. § 103(a). Accordingly, the Examiner is respectfully requested to withdraw this rejection.

In view of the foregoing remarks and claim amendments, it is respectfully submitted that the present application is in condition for allowance. Such allowance is solicited. If the Examiner has any questions regarding this response, the application is general, or has any suggestions for placing

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the application in condition for allowance, the Examiner is requested to contact the undersigned at the number listed. below.

Respectfully submitted,

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